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Gang Luo

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EXAMINER

STACE, BRENT S

ART UNIT

PAPER NUMBER

2161

DATE MAILED: 04/21/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/694,564

Applicant(s)

LUO ET AL.

Examiner

Brent S. Stace

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2161

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 27 October 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-30 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-30 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 27 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 10/27/03.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Remarks***

1. Claims 1-30 have been examined. Claims 1-30 have been rejected. This document is the first Office action on the merits.

### ***Information Disclosure Statement***

2. The information disclosure statement is being considered by the examiner.

### ***Specification***

3. The disclosure is objected to because of the following informality:
  - a. The symbol "S" is used throughout the specification to denote both a SQL statement (page 6, paragraph 21), and a session, (page 11, paragraph 35). This hinders the understanding of the application.Appropriate correction is required.

### ***Claim Rejections - 35 USC § 101***

4. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.
5. Claims 22-30 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

6. Claims 22-30 lack a useful, concrete, and tangible result because the system appears to be directed at software per se which is functional descriptive material per se that is non-statutory subject matter. Also, merely grouping queries into a second query is non-statutory because it does not appear to be transforming data into a query. The second query must be created and brought into existence. This rejection propagates downward through the dependant claims, and the dependant claims do not fix this. To expedite a complete examination of the instant application, the Claims rejected under 35 U.S.C. 101 above are further rejected as set forth below in anticipation of applicant amending these Claims to place them within the four statutory categories of invention.

***Claim Rejections - 35 USC § 102***

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

8. Claims 1-3, 14-16, and 22-25 are rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent No. 6,829,600 (Gu et al.).

**Claim 1** can be mapped to Gu as follows: "A method comprising:

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- identifying statements in a first transaction that specify modification operations that are commutative and associative; [Gu, col. 1, lines 49-67]
- combining the identified statements into one statement; [Gu, col. 1, lines 30-37] and
- submitting the one statement to a database system" [Gu, col. 1, lines 28-42].

**Claim 2** can be mapped to Gu as follows: "The method of claim 1, wherein identifying the statements comprises identifying Structured Query Language (SQL) statements" [Gu, col. 1, lines 30-37].

**Claim 3** can be mapped to Gu as follows: "The method of claim 1, wherein combining the identified statements is performed prior to submitting the one statement to the database system" [Gu, col. 1, lines 30-37 with Gu, cols. 2-3, lines 63-8].

**Claims 14-16** encompass substantially the same scope of the invention as that of Claims 1-3, respectfully, in addition to an article and some instructions for performing the method steps of Claims 1-3, respectfully. Therefore, Claims 14-16 are rejected for the same reasons as stated above with respect to Claims 1-3, respectfully.

**Claim 22** encompasses substantially the same scope of the invention as that of Claim 1, in addition to a system and some interface and controller for performing the method steps of Claim 1. Therefore, Claim 22 is rejected for the same reasons as stated above with respect to Claim 1. Additionally, Claim 22 cites "an interface to receive first queries from a client system," which is taught in Gu, col. 8, lines 52-64 with Gu, Fig. 3.

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**Claim 23** encompasses substantially the same scope of the invention as that of Claim 2, in addition to a system and some interface and controller for performing the method steps of Claim 2. Therefore, Claim 23 is rejected for the same reasons as stated above with respect to Claim 2.

**Claim 24** can be mapped to Gu as follows: "The system of claim 22, wherein the controller is adapted to send the second query to a database engine" [Gu, col. 1, lines 30-37 with Gu, cols. 2-3, lines 63-8].

**Claim 25** can be mapped to Gu as follows: "The system of claim 24, wherein the controller is adapted to group the identified first queries prior to submitting the second query to the database system" [Gu, col. 1, lines 30-37 with Gu, cols. 2-3, lines 63-8].

### ***Claim Rejections - 35 USC § 103***

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was

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not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

11. Claims 4, 17, and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,829,600 (Gu et al.) in view of "Nested Transactions with Multiple Commit Points: An approach to the Structuring of Advanced Database Applications" (Walter).

For **Claim 4**, Gu teaches: "The method of claim 1, further comprising."

Gu discloses the above limitation but does not expressly teach: "grouping plural transactions into the first transaction."

With respect to Claim 4, an analogous art, Walter, teaches: "grouping plural transactions into the first transaction" [Walter, pg. 168, paragraph under C)].

It would have been obvious to one of ordinary skill in the art at the time of invention to combine Walter with Gu because both inventions are directed towards manipulating data in databases.

Walter's invention would have been expected to successfully work well with Gu's invention because both inventions use databases. Gu discloses a merge delete statement for database operations comprising committing operations, however Gu does not expressly disclose grouping transaction. Walter discloses nested transactions with multiple commit points comprising committing child transactions upon committing the

parent transaction (grouping all child transactions into the parent when the parent commits).

It would have been obvious to one of ordinary skill in the art at the time of invention to take the multiple commit points from Walter and install it into the invention of Gu, thereby offering the obvious advantage of allowing independent transaction updating of the database.

**Claim 17** encompasses substantially the same scope of the invention as that of Claim 4, in addition to an article and some instructions for performing the method steps of Claim 4. Therefore, Claim 17 is rejected for the same reasons as stated above with respect to Claim 4.

**Claim 26** encompasses substantially the same scope of the invention as that of Claim 4, in addition to a system and some controller for performing the method steps of Claim 4. Therefore, Claim 26 is rejected for the same reasons as stated above with respect to Claim 4. Additionally, Claim 26 cites "wherein the first queries are part of a first transaction," which is taught in Gu, col. 1, lines 30-37 with Walter, pg. 161, first paragraph under Introduction.

12. Claims 5, 18, and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,829,600 (Gu et al.) in view of "Nested Transactions with Multiple Commit Points: An approach to the Structuring of Advanced Database Applications" (Walter), further in view of U.S. Patent No. 6,714,938 (Avadhanam et al.).

For **Claim 5**, Gu (as modified by Walter) teaches: "The method of claim 4."



Gu (as modified by Walter) discloses the above limitation but does not expressly teach: "wherein the identifying, combining, submitting, and grouping are performed by a module separate from a database engine of the database system."

With respect to Claim 5, an analogous art, Avadhanam, teaches: "wherein the identifying, combining, submitting, and grouping are performed by a module separate from a database engine of the database system" [Avadhanam, col. 7, lines 11-24].

It would have been obvious to one of ordinary skill in the art at the time of invention to combine Avadhanam with Gu (as modified by Walter) because both inventions are directed towards using and needing to analyze queries.

Avadhanam's invention would have been expected to successfully work well with Gu (as modified by Walter)'s invention because both inventions use database issuing queries. Gu (as modified by Walter) discloses a merge delete statement for database operations comprising a database server, however Gu (as modified by Walter) does not expressly disclose that this database server explicitly has a query optimizer that must analyze the query (although this is necessary) or that this optimizer is a separate module from a database engine of the database system. Avadhanam discloses query planning using a maxdiff histogram comprising a query optimizer that analyses queries and is, by definition, separate from a database engine of the database system.

It would have been obvious to one of ordinary skill in the art at the time of invention to take the query optimizer from Avadhanam and install it into the invention of Gu (as modified by Walter), thereby offering the obvious advantage of determining a best execution plan for a submitted query.

**Claim 18** encompasses substantially the same scope of the invention as that of Claim 5, in addition to an article and some instructions for performing the method steps of Claim 5. Therefore, Claim 18 is rejected for the same reasons as stated above with respect to Claim 5.

**Claim 19** can be mapped to Gu (as modified by Walter and Avadhanam) as follows: "The article of claim 18, wherein the identifying, combining, and submitting are performed by the controller without first accessing data in relational tables stored in the database system" [Gu, col. 1, lines 30-37 with Gu, cols. 2-3, lines 63-8 with Avadhanam, col. 7, lines 11-24].

13. Claims 6, 7, and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,829,600 (Gu et al.) in view of U.S. Patent No. 6,714,938 (Avadhanam et al.).

For **Claim 6**, Gu teaches: "The method of claim 1."

Gu discloses the above limitation but does not expressly teach: "wherein the identifying, combining, and submitting are performed by a module separate from a database engine of the database system."

With respect to Claim 6, an analogous art, Avadhanam, teaches: "wherein the identifying, combining, and submitting are performed by a module separate from a database engine of the database system" [Avadhanam, col. 7, lines 11-24].

It would have been obvious to one of ordinary skill in the art at the time of invention to combine Avadhanam with Gu because both inventions are directed towards using and needing to analyze queries.

Avadhanam's invention would have been expected to successfully work well with Gu's invention because both inventions use database issuing queries. Gu discloses a merge delete statement for database operations comprising a database server, however Gu does not expressly disclose that this database server explicitly has a query optimizer that must analyze the query (although this is necessary) or that this optimizer is a separate module from a database engine of the database system. Avadhanam discloses query planning using a maxdiff histogram comprising a query optimizer that analyses queries and is, by definition, separate from a database engine of the database system.

It would have been obvious to one of ordinary skill in the art at the time of invention to take the query optimizer from Avadhanam and install it into the invention of Gu, thereby offering the obvious advantage of determining a best execution plan for a submitted query.

**Claim 7** can be mapped to Gu (as modified by Avadhanam) as follows: "The method of claim 6, wherein the identifying, combining, and submitting are performed by the module without first accessing data in relational tables" [Gu, col. 1, lines 30-37 with Gu, cols. 2-3, lines 63-8 with Avadhanam, col. 7, lines 11-24].

**Claim 27** encompasses substantially the same scope of the invention as that of Claim 7, in addition to a system and some controller for performing the method steps of

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Claim 7. Therefore, Claim 27 is rejected for the same reasons as stated above with respect to Claim 7.

14. Claims 8-12, 20, 21, and 28-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,829,600 (Gu et al.) in view of "Lesson on Order of Operations With Exponents" (MathGoodies).

For **Claim 8**, Gu teaches: "The method of claim 1, further comprising."

Gu discloses the above limitation but does not expressly teach:

- "switching an order of statements in the first transaction to place the identified statements adjacent to each other."

With respect to Claim 8, an analogous art, MathGoodies, teaches:

- "switching an order of statements in the first transaction to place the identified statements adjacent to each other" [MathGoodies, pg. 2, Example 3 with Gu, col. 1, lines 55-67].

It would have been obvious to one of ordinary skill in the art at the time of invention to combine MathGoodies with Gu because both inventions are directed towards modifying data using math.

MathGoodies's invention would have been expected to successfully work well with Gu's invention because both inventions use math to determine an answer. Gu discloses a merge delete statement for database operations comprising an update statement that uses math in updating variables/tuples, however Gu does not expressly

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disclose reordering statements within transactions. MathGoodies discloses simplifying mathematical equations comprising solving for the answer of a mathematical problem.

It would have been obvious to one of ordinary skill in the art at the time of invention to take the simplification of mathematical equations from MathGoodies and install it into the invention of Gu, thereby offering the obvious advantage maintaining coherency when using math in transactions. In this combination, the statements of the claim are the operations of MathGoodies, which are the modification operations of Gu. As taught in mathematics, some operations, such as multiplication, are done prior to other operations, such as addition. This is reordering operations/statements.

**Claim 9** can be mapped to Gu (as modified by MathGoodies) as follows: "The method of claim 8, further comprising determining whether data dependency exists between or among the identified statements prior to switching the order of the identified statements" [MathGoodies, pg. 2, Example 3, the order in which operations are done in math define the dependencies].

For **Claim 10**, Gu teaches: "The method of claim 1."

Gu discloses the above limitation but does not expressly teach: "wherein identifying the statements comprises identifying statements  $\langle t, b_i \rangle$  through  $\langle t, b_m \rangle$ ,  $m$  being greater than 1, where  $t$  represents a set of one or more tuples, and  $b_i$  through  $b_m$  represent respective modification operations on the set of one or more tuples, and

- wherein combining the identified statements comprises combining the identified statements into statement  $\langle t, c \rangle$ , where  $c$  represents an aggregation of  $b_i$  through  $b_m$ ."

With respect to Claim 10, an analogous art, MathGoodies, teaches: "wherein identifying the statements comprises identifying statements  $\langle t, b_i \rangle$  through  $\langle t, b_m \rangle$ ,  $m$  being greater than 1, where  $t$  represents a set of one or more tuples, and  $b_i$  through  $b_m$  represent respective modification operations on the set of one or more tuples,

[MathGoodies, pg. 2, Example 3 with Gu, col. 1, lines 55-67] and

- wherein combining the identified statements comprises combining the identified statements into statement  $\langle t, c \rangle$ , where  $c$  represents an aggregation of  $b_i$  through  $b_m$ " [MathGoodies, pg. 2, Example 3 with Gu, col. 1, lines 55-67].

It would have been obvious to one of ordinary skill in the art at the time of invention to combine MathGoodies with Gu because both inventions are directed towards modifying data using math.

MathGoodies's invention would have been expected to successfully work well with Gu's invention because both inventions use math to determine an answer. Gu discloses a merge delete statement for database operations comprising an update statement that uses math in updating variables/tuples, however Gu does not expressly disclose simplifying the math within the update statement. MathGoodies discloses simplifying mathematical equations comprising solving for the answer of a mathematical problem.

It would have been obvious to one of ordinary skill in the art at the time of invention to take the simplification of mathematical equations from MathGoodies and install it into the invention of Gu, thereby offering the obvious advantage of simplifying the update parameters of the MERGE statements in Gu to save computations.

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**Claim 11** can be mapped to Gu (as modified by MathGoodies) as follows: "The method of claim 10, wherein combining the identified statements comprises combining the identified statements into statement  $\langle t, c \rangle$ , where  $c$  represents an addition of  $b_i$  through  $b_m$ " [MathGoodies, pg. 2, Example 3 with Gu, col. 1, lines 55-67].

**Claim 12** can be mapped to Gu (as modified by MathGoodies) as follows: "The method of claim 10, wherein combining the identified statements comprises combining the identified statements into statement  $\langle t, c \rangle$ , where  $c$  represents a multiplication of  $b_i$  through  $b_m$ " [MathGoodies, pg. 2, Example 3 with Gu, col. 1, lines 55-67].

**Claim 20** encompasses substantially the same scope of the invention as that of Claim 8, in addition to an article and some instructions for performing the method steps of Claim 8. Therefore, Claim 20 is rejected for the same reasons as stated above with respect to Claim 8.

**Claim 21** encompasses substantially the same scope of the invention as that of Claims 11 or 12, in addition to an article and some instructions for performing the method steps of Claims 11 or 12. Therefore, Claim 21 is rejected for the same reasons as stated above with respect to Claims 11 or 12.

**Claims 28-30** encompass substantially the same scope of the invention as that of Claims 10-12, respectfully, in addition to a system and some interface and controller for performing the method steps of Claims 10-12, respectfully. Therefore, Claims 28-30 are rejected for the same reasons as stated above with respect to Claims 10-12, respectfully.

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15. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,829,600 (Gu et al.) in view of "Nested Transactions with Multiple Commit Points: An approach to the Structuring of Advanced Database Applications" (Walter), further in view of "Introduction to Algebra" (MathLeague).

For **Claim 13**, Gu teaches: "The method of claim 1, further comprising."

Gu discloses the above limitation but does not expressly teach:

- "establishing multiple sessions with the database system, each session associated with at least one transaction;
- identifying transactions that operate on the same set of one or more tuples; and
- re-allocate transactions between or among the sessions such that the identified transactions that operate on the same set of one or more tuples is allocated to one of the sessions."

With respect to Claim 13, an analogous art, Walter, teaches:

- "establishing multiple sessions with the database system, each session associated with at least one transaction" [Walter, pg. 168, paragraph under C)].

With respect to Claim 13, an analogous art, MathLeague, teaches:

- "identifying transactions that operate on the same set of one or more tuples [MathLeague, pg. 7, Simplification by Multiplication example with Walter, pg. 168, paragraph under C) with Gu, col. 1, lines 25-37 with Gu, col. 1, lines 49-67]
- re-allocate transactions between or among the sessions such that the identified transactions that operate on the same set of one or more tuples is allocated to



one of the sessions" [MathLeague, pg. 7, Simplification by Multiplication example with Walter, pg. 168, paragraph under C)].

It would have been obvious to one of ordinary skill in the art at the time of invention to combine Walter and MathLeague with Gu because the inventions are directed towards modifying data within a period of time or a certain time.

Walter's and MathLeague's invention would have been expected to successfully work well with Gu's invention because the inventions use data manipulation operations. Gu discloses a merge delete statement for database operations comprising combining statements into one, however Gu does not expressly disclose sessions as broad enough to map to transactions, identifying alike transactions, or re-allocating transactions. Walter discloses nested transactions with multiple commit points comprising committing child transactions upon committing the parent transaction (grouping all child transactions into the parent when the parent commits). MathLeague discloses an introduction to algebra comprising simplifying equations on both sides of the equation to find the value of the variable that satisfies the equation.

It would have been obvious to one of ordinary skill in the art at the time of invention to take the transactions from Walter, the grouping of similar operations on the same group of data from MathLeague and install them into the invention of Gu, thereby offering the obvious advantage of simplifying transactions/sessions on databases of Gu. As mapped, the transactions of Walter are the sessions in the claim. Also, MathLeague, in the cited section, multiplies both sides of an equation by 12 to simplify the equation and solve for the variable. As this prior art is combined with the other arts,

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the multiplication of 12 on the left hand side of the equation is one transaction while the multiplication of 12 on the right hand side is a second transaction. These transactions are grouped together in Walter as being in the same commit scope so both sides would be modified on commit, thus solving/simplifying transactions like the cited transaction of Gu.

**Conclusion**

16. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Applicant is advised that, although not used in the rejections above, prior art cited on the PTO-892 form and not relied upon is considered materially relevant to the applicant's claimed invention and/or portions of the claimed invention.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brent S. Stace whose telephone number is 571-272-8372 and fax number is 571-273-8372. The examiner can normally be reached on M-F 9am-5:30pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jeffrey A. Gaffin can be reached on 571-272-4146. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Brent Stace

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